

REMARKS

Claims 1-5, 8-16 and 18-57 are pending, with claims 19-57 withdrawn from consideration. By this Amendment, no claims are cancelled, no new claims are added, and claims 1 and 52 are amended, with claim 52 amended to correct a misspelling and having the marker “(Withdrawn-Currently Amended)” for examination purposes.

Claim Rejections – 35 U.S.C. § 112

The June 21, 2010 Office Action rejected claims 1-5, 8-16 and 18 under 35 U.S.C. § 112, second paragraph, on the basis that there was insufficient antecedent basis for the limitation “the impregnated and calcined catalyst.” By this Amendment, independent claim 1 has been amended to recite “An impregnated and calcined catalyst...,” rendering this rejection moot. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

Claim Rejections – 35 U.S.C. §103(a)

The June 21, 2010 Office Action rejected claims 1-5, 8, 9, 16 and 18 under 35 U.S.C. § 103(a) as being unpatentable over (i) U.S. Patent 4,888,316 to Gardner et al. (“Gardner”) alone; and (ii) Gardner view of U.S. Patent Publication 2006/0167119 to Leng et al. (“Leng”). Also, claims 1-5, 8-12, 16 and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Gardner (taken alone or in view of Leng as necessary) in view of U.S. Patent 6,255,358 to Singleton et al. Further, claims 1-5, 8, 9, 13-16 and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Gardner (taken alone or in view of Leng as necessary) in view of U.S. Patent 3,988,263 to Hansford. Applicants respectfully traverse these rejections as a *prima facie* case of obviousness has not been established.

Independent claim 1 is directed to an impregnated and calcined catalyst for use in a Fischer-Tropsch synthesis reaction, the catalyst comprising cobalt supported on alumina, in which the catalyst average particle size is in the range 20 to 100 μm ; the specific surface area of the impregnated and calcined catalyst particles is greater than 120 m^2/g ; the average pore size of the impregnated and calcined catalyst is at least 90 \AA (9nm); the pore volume of the impregnated and calcined catalyst is at least 0.45 cm^3/g , and the cobalt content of the catalyst is from 10 to 40% by weight.

In each of the rejections of independent claim 1 under 35 U.S.C. § 103(a), the Examiner relies upon Gardner, either alone or in combination with Leng for the particle size limitation within the claimed range. Gardner is directed at the preparation of hydrotreating catalysts from spent hydrotreating catalyst by grinding the spent hydrotreating catalyst, mixing the ground spent catalyst with an alumina-containing material, shaping the mixture, and heating/oxidizing the shaped mixture. (Abstract; Col. 3, l. 63 to Col. 4, l. 68.) Thus, Gardner is concerned with a process for “reconditioning” or “regenerating and reusing” a spent hydrotreating catalyst composition.

Regarding independent claim 1 and citing Gardner at Col. 5, lines 48-60, the Examiner improperly asserts that Gardner teaches a reconditioned catalyst comprising Co on Al_2O_3 suitable for such processes as Fischer-Tropsch (“F-T”) syntheses. The passage of Gardner cited by the Examiner specifically states:

The calcined shaped catalyst composition comprising alumina-containing material and oxidized (regenerated) spent catalyst composition *can be employed as a catalyst composition in a variety of **hydrocarbon conversion processes***, but is particularly effective as a catalyst composition in hydrofining processes employing metal-containing hydrocarbon-containing feed oils. In one preferred embodiment of this invention, the catalyst composition of this invention is used as

a catalyst for hydrotreating substantially liquid hydrocarbon-containing feed streams which also contain compounds (mainly organic compounds) of nickel and/or vanadium and of sulfur as impurities.

(Gardner, Col. 5, ln. 48-60 (emphasis added).) A person skilled in the art would be aware that an F-T synthesis process would generally not be considered to be a “hydrocarbon conversion process.” In fact, synthesis gas (carbon dioxide and hydrogen) is used as the feedstock for an F-T synthesis, which is not a hydrocarbonaceous feed. Thus, Gardner fails to teach, disclose or even suggest an F-T synthesis reaction catalyst as claimed in independent claim 1.

Gardner also explicitly teaches away from an F-T synthesis reaction catalyst in an activated state. As provided in the passage above, Gardner teaches that the calcined shaped catalyst composition is “oxidized.” (*Id.*) Gardner also more specifically discloses that “[h]eating step (d) is carried out in under oxidizing conditions...so as to oxidize the carbonaceous deposits on the spent catalyst component to carbon oxides (CO₂ and/or CO), and to substantially *convert metal sulfides to metal oxides.*” (Col. 4, ln. 59-64.) For a catalyst composition to function at all as an F-T synthesis reaction catalyst, the catalytically active metal would have to be in an activated state, that is to say its metallic state, and not the oxidized state. Moreover, besides hydrotreating catalysts being produced in their oxidized state, these catalysts are normally pre-sulfided, as indicated in the foregoing passage of Col. 4, ln. 59-64, which further makes the Gardner catalysts inappropriate for use as an F-T synthesis reaction catalyst.

Moreover, the Examiner admits that Gardner does not explicitly teach an average catalyst particle size within the claimed range of independent claim 1. Instead, the Examiner speculates that an appropriate fresh particle’s size is either approximately the size of the ground spent catalyst or smaller, since the catalyst acquires impurities and is thus enlarged during the fouling

process. Respectfully, Gardner discloses the reconditioned catalysts being intended for use in hydrotreating operations and specifically states:

The pasty mixture obtained in step (b) can be shaped in step (c) by any conventional shaping process, such as extrusion through at least one die (round or square or trilobal and the like) and subsequent cutting the extruded strand(s), or by pelletizing (using a disc pelletizer or a press or any other conventional pelletizing equipment), and the like. Generally, the size of the thus shaped particles is such as to provide particles in subsequent heating step (d) of such size as to make them suitable for use in fixed catalyst beds, as is well known by those skilled in the art.

(Col. 4, ln. 33-43.) This passage suggests that the appropriate size of catalysts in hydrotreating operations is larger, not smaller, than the ground size of the spent catalyst. The Examiner's conclusory argument regarding the catalyst particles size fails to appreciate the hydrotreating catalyst technology and is merely conclusory without a sufficient underlying basis. Accordingly, based upon the foregoing and contrary to the Examiner's arguments, Gardner actually teaches away from an F-T synthesis reaction catalyst, and the assertion that the catalysts in Gardner would be suitable for an F-T synthesis would render the Gardner reference unsatisfactory for its intended purpose.

While the Examiner makes a preemptory argument that Leng teaches F-T catalysts having particles sizes within the range claimed in independent claim 1, the Examiner's argument is premised upon modifying the particle size of the Gardner catalyst. However, as discussed above, the Gardner catalyst is directed to a hydrotreating catalyst for use in fixed bed applications, which teaches away from the particle sizes claimed in independent claim 1. Further, this proposed modification would render the Gardner catalyst unsatisfactory for its intended purpose in fixed bed applications for hydrotreating operations, which is starkly different than the particle size range for slurry bed catalysts in an F-T reaction synthesis.

Thus, a *prima facie* case of obviousness has not been established, as the cited references, individually or in combination, do not teach or suggest all of the features included in independent claim 1. If an independent claim is non-obvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837, F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Therefore, Applicants are not presenting additional arguments with respect to the patentability of the dependent claims, although Applicants do not acquiesce to any of the rejections and reserve the right to raise additional arguments with respect to the patentability of such claims. As all remaining pending claims depend directly or indirectly from one of the subject claims, Applicants respectfully request that the rejections under § 103 be withdrawn. Also, because a *prima facie* case of obviousness has not been established, Applicants do not comment further here on the suitability of combining or modifying the cited references. Thus, Applicants respectfully request reconsideration and withdrawal of these rejections.

Conclusion

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'B. L. Stender', enclosed within a large, loopy circular flourish.

Brian L. Stender
Registration No. 56836

Customer No. 24113
Patterson Thunte Christensen Pedersen, P.A.
4800 IDS Center
80 South 8th Street
Minneapolis, Minnesota 55402-2100
Telephone: 612.252.1548